# ACTA MATERIALIA CONTENTS OF VOLUME 50

## NUMBER 1

|   | 1   | Announcement  |
|---|-----|---|
|   | 3   | Announcement  |
| P. Tartaj and J. Tartaj   | 5   | Preparation, characterization and sintering behavior of spherical iron oxide doped alumina particles  |
| Y. H. Wen, Y. Wang and<br>L. Q. Chen                                    | 13  | Coarsening dynamics of self-accommodating coherent patterns   |
| R. Saha and W. D. Nix   | 23  | Effects of the substrate on the determination of thin film mechanical properties by nanoindentation   |
| M. Kouzeli and A. Mortensen   | 39  | Size dependent strengthening in particle reinforced aluminium   |
| V. A. Chernenko, J. Pons,<br>C. Seguí and E. Cesari                     | 53  | Premartensitic phenomena and other phase transformations in Ni-Mn-Ga alloys studied by dynamical mechanical analysis and electron diffraction           |
| V. Yamakov, D. Wolf,<br>S. R. Phillpot and<br>H. Gleiter                | 61  | Grain-boundary diffusion creep in nanocrystalline palladium by molecular-dynamics simulation  |
| G. Levi and W. D. Kaplan  | 75  | Oxygen induced interfacial phenomena during wetting of alumina by liquid aluminium  |
| H. Assadi and J. Schroers   | 89  | Crystal nucleation in deeply undercooled melts of bulk metallic glass forming systems   |
| A. Nakamura, T. Yamamoto and Y. Ikuhara                                 | 101 | Direct observation of basal dislocation in sapphire by HRTEM  |
| R. Yang, Y. M. Wang,<br>Y. Zhao, L. B. Wang,<br>H. Q. Ye and C. Y. Wang | 109 | Transition metal alloying effects on chemical bonding in ${\rm TiH_2}$  |
| L. E. Murr, E. A. Trillo,<br>A. A. Bujanda and<br>N. E. Martinez        | 121 | Comparison of residual microstructures associated with impact craters in fcc stainless steel and bcc iron targets: the microtwin versus microband issue |
| S. Balasubramanian and L. Anand   | 133 | Plasticity of initially textured hexagonal polycrystals at high homologous temperatures: application to titanium  |
|   |     |   |

Z. Xue, Y. Huang and M. Li 149 Particle size effect in metallic materials: a study by the theory of mechanism-based strain gradient plasticity H. Y. Yasuda, R. Jimba and 161 Cyclic deformation behaviour of  $\gamma'$ -Ni<sub>3</sub>(Al, Ti) single Y. Umakoshi crystal containing disordered y precipitates C. Y. Barlow, N. Hansen and 171 Fine scale structures from deformation of aluminium Y. L. Liu containing small alumina particles W. Xu, Y. P. Feng, Y. Li, 183 Rapid solidification behavior of Zn-rich Zn-Ag peritectic G. D. Zhang and Z. Y. Li allovs T. Harry and D. J. Bacon 195 Computer simulation of the core structure of the <111> screw dislocation in  $\alpha$ -iron containing copper precipitates: I. structure in the matrix and a precipitate T. Harry and D. J. Bacon 209 Computer simulation of the core structure of the <111> screw dislocation in  $\alpha$ -iron containing copper precipitates: II. dislocation-precipitate interaction and the strengthening effect I Keywords NUMBER 2 B. J. Kooi, O. Wouters and 223 Analysis of Gibbsian segregation at heterophase interfaces J. Th. M. De Hosson using analytical transmission electron microscopy: a novel approach N. Frage, N. Froumin and 237 Wetting of TiC by non-reactive liquid metals M. P. Dariel J. M. Molina, 247 Pressure infiltration of liquid aluminium into packed SiC R. A. Saravanan, R. Arpón, particulate with a bimodal size distribution C. García-Cordovilla, E. Louis and J. Narciso D. Wang, J. D. Clewley, 259 The interaction of dissolved H with internally oxidized Pd-T. B. Flanagan, Rh alloys R. Balasubramaniam and K. L. Shanahan N. Gey and M. Humbert Characterization of the variant selection occurring during the  $\alpha \rightarrow \beta \rightarrow \alpha$  phase transformations of a cold rolled titanium sheet A. Schwab and C. Holste 289 Prediction of the cyclic stress-strain curve of polycrystalline nickel

N. Mattern, U. Kühn, Short-range order of Zr<sub>62-x</sub>Ti<sub>x</sub>Al<sub>10</sub>Cu<sub>20</sub>Ni<sub>8</sub> bulk metallic H. Hermann, H. Ehrenberg, glasses J. Neuefeind and J. Eckert S. Yang, W. Huang, W. Liu, Development of microstructures in laser surface remelting 315 M. Zhong and Y. Zhou of DD2 single crystal H. Scherngell and 327 Generation, development and degradation of the intrinsic A. C. Kneissl two-way shape memory effect in different alloy systems L. Klinger and E. Rabkin 343 Effect of strong surface anisotropy on morphology of periodic surface profiles M. Winning, G. Gottstein and 353 On the mechanisms of grain boundary migration L. S. Shvindlerman C. H. Zhou, L. S. Schadler 365 Time-dependent micromechanical behavior in and I. J. Beyerlein graphite/epoxy composites under constant load: a combined experimental and theoretical study I. Ohnuma, H. Enoki, 379 Phase equilibria in the Fe-Co binary system O. Ikeda, R. Kainuma, H. Ohtani, B. Sundman and K. Ishida 395 Y. L. Li, S. Y. Hu, Z. K. Liu Effect of substrate constraint on the stability and evolution and L. Q. Chen of ferroelectric domain structures in thin films R. Kirchheim 413 Grain coarsening inhibited by solute segregation D. Raabe, Z. Zhao, S.-J. Park Theory of orientation gradients in plastically strained 421 and F. Roters crystals Keywords NUMBER 3 Overview A. A. Volinsky, N. R. Moody Interfacial toughness measurements for thin films on 441 and W. W. Gerberich substrates M. Tang, J. H. Zhang and 467 One-dimensional model of martensitic transformations T. Y. Hsu (Xu Zuyao) H. W. Sheng, G. Wilde 475 The competing crystalline and amorphous solid solutions in and E. Ma the Ag-Cu system S. J. Pang, T. Zhang, 489 Synthesis of Fe-Cr-Mo-C-B-P bulk metallic glasses with K. Asami and A. Inoue high corrosion resistance

On the theory of grain growth in systems with anisotropic A. Kazaryan, B. R. Patton, boundary mobility S. A. Dregia and Y. Wang Cavity formation and early growth in a superplastic D. H. Bae and A. K. Ghosh 511 Al-Mg allov On the diffusional growth of compounds with narrow V. Buscaglia and 525 U. Anselmi-Tamburini homogeneity range in multiphase binary systems D. Suh, P. Asoka-Kumar and 537 The effects of hydrogen on viscoelastic relaxation in R. H. Dauskardt Zr-Ti-Ni-Cu-Be bulk metallic glasses: implications for hydrogen embrittlement S. Lee, A. Utsunomiya, Influence of scandium and zirconium on grain stability and H. Akamatsu, K. Neishi, M. superplastic ductilities in ultrafine-grained Al-Mg alloys Furukawa, Z. Horita and T. G. Langdon A. Ziegler, C. Kisielowski and Imaging of the crystal structure of silicon nitride at 0.8 565 R. O. Ritchie Ångström resolution Q. Xue, M. A. Meyers and V. 575 Self-organization of shear bands in titanium and F. Nesterenko Ti-6Al-4V alloy K. Kaneko, N. Honbe, Triple-layered, thick glassy grain boundaries in porous M. Matsumoto. cordierite ceramics Y. Yasutomi, T. Saitoh and Y. Takigawa M.-H. Lin and H.-Y. Lu 605 Hexabarium 17-titanate in pressureless-sintered TiO2-excess barium titanate D. J. Siegel, L. G. Hector Jr. First-principles study of metal-carbide/nitride adhesion: 619 and J. B. Adams Al/VC vs. Al/VN R. Banerjee, S. Amancherla, 633 Modeling of site occupancies in B2 FeAl and NiAl alloys S. Banerjee and with ternary additions H. L. Fraser G. B. Thompson, Chemical ordering and texture in Ni-25 at% Al thin films 643 R. Banerjee, X. D. Zhang, P. M. Anderson and H. L. Fraser G. C. Kaschner and Evolution of dislocation glide kinetics during cyclic 653 J. C. Gibeling deformation of copper Keywords

## NUMBER 4

| V. Sahajwalla and R. Khanna   | 663 | Influence of sulfur on the solubility of graphite in Fe-C-S melts: optimization of interaction parameters  |
|---|-----|--|
| J. Weertman   | 673 | Anomalous work hardening, non-redundant screw dislocations in a circular bar deformed in torsion, and non-redundant edge dislocations in a bent foil |
| MR. Yang and S. K. Wu   | 691 | The improvement of high-temperature oxidation of Ti-50Al by anodic coating in the phosphoric acid  |
| G. Gottstein and<br>L. S. Shvindlerman  | 703 | Triple junction drag and grain growth in 2D polycrystals   |
| N. Orlovskaya, Y. Gogotsi, M. Reece, B. Cheng and I. Gibson   | 715 | Ferroelasticity and hysteresis in LaCoO <sub>3</sub> based perovskites   |
| M. Leonhardt, W. Löser and HG. Lindenkreuz  | 725 | Phase selection in undercooled peritectic Fe-Mo alloys   |
| W. M. Rainforth, M. P. Black, R. L. Higginson, E. J. Palmiere, C. M. Sellars, I. Prabst, P. Warbichler and F. Hofer | 735 | Precipitation of NbC in a model austenitic steel   |
| C. Iwamoto and Si. Tanaka   | 749 | Atomic morphology and chemical reactions of the reactive wetting front   |
| A. Biswas, S. K. Roy,<br>K. R. Gurumurthy,<br>N. Prabhu and S. Banerjee   | 757 | A study of self-propagating high-temperature synthesis of NiAl in thermal explosion mode   |
| C. E. Campbell,<br>W. J. Boettinger and<br>U. R. Kattner  | 775 | Development of a diffusion mobility database for Ni-base superalloys   |
| J. Khalil Allafi, X. Ren and G. Eggeler   | 793 | The mechanism of multistage martensitic transformations in aged Ni-rich NiTi shape memory alloys   |
| I. Baker and J. Li  | 805 | Directional annealing of cold-rolled copper single crystals  |
| H. Paul, J. H. Driver<br>and Z. Jasieński   | 815 | Shear banding and recrystallization nucleation in a Cu-2%Al alloy single crystal   |
| V. S. Deshpande,<br>A. Needleman and<br>E. Van der Giessen  | 831 | Discrete dislocation modeling of fatigue crack propagation   |
|   |     |  |

T. Takasugi, H. Honjo, 847 Plastic flow instabilities of L12 Co3Ti alloys at Y. Kaneno and H. Inoue intermediate temperatures A. Wikström and M. Nygårds 857 Anisotropy and texture in thin copper films—an elastoplastic analysis D. Gloaguen, M. François, Evolution of internal stresses in rolled Zr702α R. Guillen and J. Royer I Keywords NUMBER 5 881 Editorial J.-W. Park, P. F. Mendez and 883 Strain energy distribution in ceramic-to-metal joints T. W. Eagar Ch.-A. Gandin, Y. Bréchet, 901 Modelling of solidification and heat treatment for the M. Rappaz, G. Canova, prediction of yield stress of cast alloys M. Ashby and H. Shercliff H. Guo and M. Enomoto Surface relief effects of a precipitates in a Ti-Mo alloy 929 K. T. Moore, W. C. Johnson, 943 On the interaction between Ag-depleted zones surrounding J. M. Howe, H. I. Aaronson y plates and spinodal decomposition in an Al-22 at.% Ag and D. R. Veblen alloy E. Cadel, D. Lemarchand, 957 Atom probe tomography investigation of the microstructure S. Chambreland and D. of superalloys N18 Blavette J. Svoboda, F. D. Fischer and 967 Influence of solute segregation and drag on properties of E. Gamsjäger migrating interfaces O. Dezellus, F. Hodaj, 979 Spreading of Cu-Si alloys on oxidized SiC in vacuum: C. Rado. experimental results and modelling J. N. Barbier and N. Eustathopoulos D. H. Bae and A. K. Ghosh 993 Cavity growth during superplastic flow in an Al-Mg alloy: I. Experimental study D. H. Bae and A. K. Ghosh 1011 Cavity growth in a superplastic Al-Mg alloy: II. An improved plasticity based model M. E. Fitzpatrick, 1031 Changes in the misfit stresses in an Al/SiC<sub>p</sub> metal matrix P. J. Withers. composite under plastic strain A. Baczmanski, M. T. Hutchings, R. Levy, M. Ceretti and A. Lodini

H. X. Zhu and A. H. Windle 1041 Effects of cell irregularity on the high strain compression of open-cell foams B. F. Sørensen 1053 Cohesive law and notch sensitivity of adhesive joints M. Y. He, J. W. Hutchinson 1063 Large deformation simulations of cyclic displacement and A. G. Evans instabilities in thermal barrier systems K. Morita and K. Hiraga 1075 Critical assessment of high-temperature deformation and deformed microstructure in high-purity tetragonal zirconia containing 3 mol.% yttria T. E. Mitchell, J. P. Hirth and 1087 Apparent activation energy and stress exponent in materials A. Misra with a high Peierls stress O. Z. Chen, N. Jones and 1095 The microstructures of base/modified RR2072 SX D. M. Knowles superalloys and their effects on creep properties at elevated temperatures M. Sherif El-Eskandarany, 1113 Cyclic phase transformations of mechanically alloyed K. Aoki, K. Sumiyama and Co75Ti25 powders K. Suzuki M. Schehl, L. A. Díaz and 1125 Alumina nanocomposites from powder–alkoxide mixtures R. Torrecillas D. Goberman, Y. H. Sohn, 1141 Microstructure development of Al<sub>2</sub>O<sub>3</sub>-13wt.%TiO<sub>2</sub> plasma L. Shaw, E. Jordan and sprayed coatings derived from nanocrystalline powders M. Gell B. Venkataraman and 1153 The influence of sample geometry on the friction G. Sundararajan behaviour of carbon-carbon composites R. Raj, A. Saha, L. An, 1165 Ion exchange at a metal-ceramic interface D. P. H. Hasselman and P. Ernst F. Wakai, Y. Shinoda, 1177 Topological transformation of grains in superplasticity-like S. Ishihara and deformation A. Domínguez-Rodríguez A. Zimmermann, A. Bauer, 1187 High-temperature deformation of amorphous Si-C-N and M. Christ, Y. Cai and Si-B-C-N ceramics derived from polymers F. Aldinger B. Erdem Alaca, M. T. A. Saif 1197 On the interface debond at the edge of a thin film on a and H. Sehitoglu thick substrate A. M. Karlsson, T. Xu and 1211 The effect of the thermal barrier coating on the A. G. Evans displacement instability in thermal barrier systems

1219 An experimental study of the influence of imperfections on M.-W. Moon, J.-W. Chung, K.-R. Lee, K. H. Oh, the buckling of compressed thin films R. Wang and A. G. Evans S. G. Roberts, S. J. Noronha, 1229 Modelling the initiation of cleavage fracture of ferritic A. J. Wilkinson and steels P. B. Hirsch F. Wagner, N. Bozzolo, 1245 Evolution of recrystallisation texture and microstructure in O. Van Landuyt and low alloyed titanium sheets T. Grosdidier I Keywords NUMBER 6 1261 Editorial A. M. Karlsson, C. G. Levi 1263 A model study of displacement instabilities during cyclic and A. G. Evans V. Narayanan, S. Mahajan, 1275 Antiphase boundaries in GaP layers grown on (001) Si by K. J. Bachmann, V. Woods chemical beam epitaxy and N. Dietz K. Osaka and T. Takama 1289 X-ray study of the short-range order structure in Cu-24.3 at.% Mn alloy M. Radovic, M. W. Barsoum, 1297 Effect of temperature, strain rate and grain size on the T. El-Raghy, mechanical response of Ti<sub>3</sub>SiC<sub>2</sub> in tension S. M. Wiederhorn and W. E. Luecke J. N. Wang, J. Zhu, J. S. Wu 1307 Effects of alloying elements on creep of TiAl alloys with a and X. W. Du fine lamellar structure A. T. W. Kempen, F. Sommer 1319 The isothermal and isochronal kinetics of the crystallisation and E. J. Mittemeijer of bulk amorphous Pd40Cu30P20Ni10 L. Liu, A. Hirose and A numerical approach for predicting laser surface K. F. Kobayashi annealing process of Inconel 718 C. A. Schuh and 1349 Enhanced densification of zinc powders through thermal D. C. Dunand cycling Y. Fukuda, K. Oh-ishi, 1359 Processing of a low-carbon steel by equal-channel angular Z. Horita pressing and T. G. Langdon J. Svoboda, F. D. Fischer, 1369 Diffusion in multi-component systems with no or dense P. Fratzl and A. Kroupa sources and sinks for vacancies

H. Sahlaoui, H. Sidhom 1383 Prediction of chromium depleted-zone evolution during and J. Philibert aging of Ni-Cr-Fe alloys C. Milanese, V. Buscaglia, 1393 Reactive diffusion in the system vanadium-silicon F. Maglia and U. Anselmi-Tamburini M. Upmanyu, D. J. Srolovitz, 1405 Molecular dynamics simulation of triple junction migration L. S. Shvindlerman and G. Gottstein M. D. Demetriou. 1421 Kinetic modeling of phase selection during non-equilibrium N. M. Ghoniem and solidification of a tungsten-carbon system A. S. Lavine J. Markmann, A. Tschöpe 1433 Low temperature processing of dense nanocrystalline and R. Birringer yttrium-doped cerium oxide ceramics M. Oliveira, S. Agathopoulos 1441 The influence of BaO additives on the reaction of Al<sub>2</sub>O<sub>3</sub>and J. M. F. Ferreira SiO<sub>2</sub> ceramics with molten Al and Al-Si alloys P. F. Thomason, G. Rauchs 1453 Multi-scale finite-element modelling of fatigue-crack and P. J. Withers growth in TiAl intermetallic matrix TiNb and Nb platelet composites J. Tarasiuk, Ph. Gerber 1467 Estimation of recrystallized volume fraction from EBSD and B. Bacroix Y. Wu and S. K. Hwang 1479 Microstructural refinement and improvement of mechanical properties and oxidation resistance in EPM TiAl-based intermetallics with yttrium addition F. Dherbey, F. Louchet, 1495 Elevated temperature creep of polycrystalline uranium A. Mocellin and S. Leclercq dioxide: from microscopic mechanisms to macroscopic behaviour J. P. Chateau, D. Delafosse 1507 Numerical simulations of hydrogen-dislocation interactions in and T. Magnin fcc stainless steels. Part I: hydrogen-dislocation interactions in bulk crystals J. P. Chateau, D. Delafosse 1523 Numerical simulations of hydrogen-dislocation interactions in fcc stainless steels. Part II: hydrogen effects on crack tip and T. Magnin plasticity at a stress corrosion crack T. O. Saetre 1539 On the theory of normal grain growth in two dimensions A. Belyakov, T. Sakai, 1547 Continuous recrystallization in austenitic stainless steel H. Miura, R. Kaibyshev and after large strain deformation K. Tsuzaki

1559 Numerical determination of liquid flow permeabilities for S. G. R. Brown, J. A. Spittle, equiaxed dendritic structures D. J. Jarvis and R. Walden-Bevan 1571 Measurement of intrinsic diffusion coefficients of Al and K. Fujiwara and Z. Horita Ni in Ni<sub>3</sub>Al using Ni/NiAl diffusion couples Small-angle neutron scattering of precipitates in Ni-Ti 1581 M. Kompatscher, B. Demé, G. Kostorz, Ch. Somsen and shape memory alloys F. F. Wassermann R. Sebald and G. Gottstein 1587 Modeling of recrystallization textures: interaction of nucleation and growth Y. L. Chiu and 1599 Time-dependent characteristics of incipient plasticity in A. H. W. Ngan nanoindentation of a Ni<sub>3</sub>Al single crystal M. R. Daymond and 1613 Elastoplastic deformation of ferritic steel and cementite H. G. Priesmeyer studied by neutron diffraction and self-consistent modelling T. Lorentzen, M. R. Daymond, 1627 Lattice strain evolution during cyclic loading of stainless B. Clausen and C. N. Tomé steel I Keywords NUMBER 7 A. Vinogradov, V. Patlan, Structure and properties of ultra-fine grain Cu-Cr-Zr alloy 1639 Y. Suzuki, K. Kitagawa and produced by equal-channel angular pressing V. I. Kopylov S. Kok, A. J. Beaudoin and On the development of stage IV hardening using a model D. A. Tortorelli based on the mechanical threshold T. Rouxel, J.-C. Sanglebœuf, 1669 Temperature dependence of Young's modulus in Si<sub>3</sub>N<sub>4</sub>-M. Huger, C. Gault, based ceramics: roles of sintering additives and of SiC-J.-L. Besson and S. Testu particle content Mechanism of solid-state dissolution of WC in Co-based O. Lavergne, F. Robaut, 1683 solutions F. Hodaj and C. H. Allibert M. Vandvoussefi and Application of cellular automaton-finite element model to 1693 A. L. Greer the grain refinement of directionally solidified Al-4.15 wt% Mg alloys E. A. Brener and 1707 Theory of diffusion induced grain boundary migration: is D. E. Temkin mass transport along free surfaces important? Y. D. Wang, R. Lin Peng, 1717 Grain-orientation-dependent residual stress and the effect X.-L. Wang and of annealing in cold-rolled stainless steel R. L. McGreevy

F. Zimmermann and 1735 Determination of the habit plane characteristics in the  $\beta$ - $\alpha'$ M. Humbert phase transformation induced by stress in Ti-5Al-2Sn-4Zr-4Mo-2Cr-1Fe M. Humbert, B. Gardiola, 1741 Modelling of the variant selection mechanism in the phase C. Esling, G. Flemming and transformation of HSLA steel produced by compact strip K. E. Hensger production D. H. Bae, H. K. Lim. 1749 Mechanical behavior of a bulk Cu-Ti-Zr-Ni-Si-Sn S. H. Kim, D. H. Kim and metallic glass forming nano-crystal aggregate bands during W. T. Kim deformation in the supercooled liquid region P. Asoka-Kumar, 1761 Direct observation of carbon-decorated defects in fatigued J. H. Hartley, R. H. Howell, type 304 stainless steel using positron annihilation P. A. Sterne, D. Akers, spectroscopy V. Shah and A. Denison L. Margulies, T. Lorentzen, 1771 Strain tensor development in a single grain in the bulk of H. F. Poulsen and T. Leffers a polycrystal under loading T. Nakano, Y. Nakai, 1781 Microstructure of duplex-phase NbSi<sub>2</sub>(C40)/MoSi<sub>2</sub>(C11<sub>b</sub>) S. Maeda and Y. Umakoshi crystals containing a single set of lamellae J. F. Li, W. Q. Jie, 1797 Solidification structure formation in undercooled Fe-Ni G. C. Yang and Y. H. Zhou alloy A. Roytburd and J. Slutsker 1809 Coherent phase equilibria in a bending film J. Y. Park, K. S. Han, 1825 Influence of primary annealing condition on texture J. S. Woo, S. K. Chang, development in grain oriented electrical steels N. Rajmohan and J. A. Szpunar R. Wang, J. Gui, X. Chen and 1835 EBSD and TEM study of self-accommodating martensites in Cu75.7Al15.4Mn8.9 shape memory alloy S. Tan Y. S. Liu, L. Delannay and 1849 Application of the Lamel model for simulating cold rolling P. Van Houtte texture in molybdenum sheet T. A. Parthasarathy, 1857 Oxidation mechanisms in Mo-reinforced Mo<sub>5</sub>SiB<sub>2</sub>(T2)-M. G. Mendiratta and Mo<sub>3</sub>Si alloys D. M. Dimiduk J. Zhang and R. F. Singer Hot tearing of nickel-based superalloys during directional 1869 solidification Y. Choi and S. Suresh Size effects on the mechanical properties of thin polycrystalline metal films on substrates I Keywords

## NUMBER 8

| D. Fan, S. P. Chen,<br>LQ. Chen and P. W.<br>Voorhees                        | 1895 | Phase-field simulation of 2-D Ostwald ripening in the high volume fraction regime   |
|--|------|---|
| A. Jacot and M. Rappaz   | 1909 | A pseudo-front tracking technique for the modelling of solidification microstructures in multi-component alloys             |
| DM. Liu  | 1927 | Theoretical determination of floc size in highly-<br>concentrated zirconia-wax suspensions                                  |
| Z. Shi, Z. X. Guo and<br>J. H. Song  | 1937 | A diffusion-controlled kinetic model for binder burnout in a powder compact   |
| S. Diplas, P. Tsakiropoulos,<br>G. Shao, J. F. Watts and<br>J. A. D. Matthew | 1951 | A study of alloying behaviour in the Ti-Al-V system   |
| D. Horvitz and I. Gotman   | 1961 | Pressure-assisted SHS synthesis of MgAl <sub>2</sub> O <sub>4</sub> -TiAl in situ composites with interpenetrating networks |
| K. Nagashio and<br>K. Kuribayashi  | 1973 | Phase selection in the undercooled peritectic $Y_3 Fe_5 O_{12}$ melt  |
| H. Zhang and H. Wong   | 1983 | Coupled grooving and migration of inclined grain boundaries: Regime I   |
| H. Zhang and H. Wong   | 1995 | Coupled grooving and migration of inclined grain boundaries: Regime II  |
| C. Motz and R. Pippan  | 2013 | Fracture behaviour and fracture toughness of ductile closed-cell metallic foams   |
| Y. T. Pei, V. Ocelik and<br>J. Th. M. De Hosson                              | 2035 | SiC <sub>p</sub> /Ti6Al4V functionally graded materials produced by laser melt injection                                    |
| S. Güngör  | 2053 | Residual stress measurements in fibre reinforced titanium alloy composites  |
| X. Wu, N. Tao, Y. Hong,<br>B. Xu,<br>J. Lu and K. Lu                         | 2075 | Microstructure and evolution of mechanically-induced ultrafine grain in surface layer of Al-alloy subjected to USSP         |
| A. C. Lund and<br>P. W. Voorhees   | 2085 | The effects of elastic stress on coarsening in the Ni-Al system   |
| G. Ghosh and G. B. Olson   | 2099 | Precipitation of paraequilibrium cementite: Experiments, and thermodynamic and kinetic modeling                             |

A. Gholinia, P. Bate and 2121 Modelling texture development during equal channel P. B. Prangnell angular extrusion of aluminium A. S. Gandhi and V. Jayaram 2137 Pressure consolidation of amorphous ZrO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub> by plastic deformation of powder particles S. B. Lee, W. Sigle and 2151 Investigation of grain boundaries in abnormal grain growth M. Rühle structure of TiO2-excess BaTiO3 by TEM and EELS analysis D. Iliescu and E. M. Schulson 2163 Brittle compressive failure of ice: monotonic versus cyclic loading Y. Murakami, D. Shindo, Magnetic domain structures in Co-Ni-Al shape memory 2173 K. Oikawa, R. Kainuma and alloys studied by Lorentz microscopy and electron K. Ishida holography I Keywords NUMBER 9 G. Inden 2185 Introduction to the following papers presented at the Symposium "Computational Thermodynamics and Materials Design" C. Wolverton, X.-Y. Yan, 2187 Incorporating first-principles energetics in computational R. Vijayaraghavan and thermodynamics approaches V. Ozolinš X. Yan, S. Chen, F. Xie and 2199 Computational and experimental investigation of Y. A. Chang microsegregation in an Al-rich Al-Cu-Mg-Si quaternary alloy A. N. Grundy, B. Hallstedt 2209 Experimental phase diagram determination and and L. J. Gauckler thermodynamic assessment of the La<sub>2</sub>O<sub>3</sub>-SrO system K. Oikawa, G.-W. Qin, Direct evidence of magnetically induced phase separation 2223 T. Ikeshoji, R. Kainuma and in the fcc phase and thermodynamic calculations of phase K. Ishida equilibria of the Co-Cr system K. Ishikawa, R. Kainuma, 2233 Phase stability of the X<sub>2</sub>AlTi (X: Fe, Co, Ni and Cu) I. Ohnuma, K. Aoki and Heusler and B2-type intermetallic compounds K. Ishida R. E. Hackenberg, M. C. Gao, 2245 Thermodynamics and phase equilibria of the Al-Fe-Gd L. Kaufman and metallic glass-forming system G. J. Shiflet Dong Jin Seol, Kyu Hwan Oh, 2259 Phase-field modelling of the thermo-mechanical properties Jung Wook Cho, Jung-Eui of carbon steels Lee and U-Sok Yoon

#### Regular Papers

Y .- J. Chen and S. H. Davis 2269 Dynamics and instability of triple junctions of solidifying eutectics: flow-modified morphologies M. R. Barnett and 2285 The generation of new high-angle boundaries in aluminium F. Montheillet during hot torsion Y. F. Gao, W. Lu and Z. Suo 2297 A mesophase transition in a binary monolayer on a solid surface H.-S. Yang, G.-R. Bai, 2309 Interfacial thermal resistance in nanocrystalline yttria-L. J. Thompson and stabilized zirconia J. A. Eastman D. Godard, P. Archambault, 2319 Precipitation sequences during quenching of the AA 7010 E. Aeby-Gautier and alloy G. Lapasset M. Shimada, H. Kokawa, 2331 Optimization of grain boundary character distribution for Z. J. Wang, Y. S. Sato and intergranular corrosion resistant 304 stainless steel by twin-I. Karibe induced grain boundary engineering D. H. Bae, S. H. Kim. 2343 Deformation behavior of Mg-Zn-Y alloys reinforced by D. H. Kim and W. T. Kim icosahedral quasicrystalline particles M. Hecker, E. Thiele and 2357 Investigation of the tensor character of mesoscopic internal C. Holste stresses in tensile-deformed nickel single crystals by X-ray diffraction J. W. Kysar and C. L. Briant 2367 Crack tip deformation fields in ductile single crystals L. Llanes, Y. Torres and 2381 On the fatigue crack growth behavior of WC-Co cemented M. Anglada carbides: kinetics description, microstructural effects and fatigue sensitivity J. M. Snodgrass, D. Pantelidis, 2395 Subcritical debonding of polymer/silica interfaces under M. L. Jenkins, monotonic and cyclic loading J. C. Bravman and R. H. Dauskardt B. P. Kashyap 2413 Towards interrelationship of grain size, cell parameters and flow stress in type 316L stainless steel M. Hillert and J. Agren 2429 Effect of surface free energy and surface stress on phase equilibria N. A. Zarkevich. 2443 Structure and stability of hcp bulk and nano-precipitated D. D. Johnson and A. V. Smirnov

C.-M. Chen and S.-W. Chen 2461 Electromigration effect upon the Sn/Ag and Sn/Ni interfacial reactions at various temperatures

## I Keywords

## NUMBER 10

| N. I. Medvedeva,<br>Yu. N. Gornostyrev and<br>A. J. Freeman   | 2471 | Carbon stabilized A15 Cr <sub>3</sub> Re precipitates and ductility enhancement of Cr-based alloys                                    |
|---|------|---|
| G. Rauchs, M. Preuss and P. J. Withers  | 2477 | Micromechanical analysis of internal stress development during single-fibre fragmentation testing of Ti/SiC $_{\rm f}$                |
| A. Kazaryan, Y. Wang,<br>S. A. Dregia and B. R.<br>Patton   | 2491 | Grain growth in anisotropic systems: comparison of effects of energy and mobility   |
| V. Mohles and B. Fruhstorfer  | 2503 | Computer simulations of Orowan process controlled dislocation glide in particle arrangements of various randomness                    |
| <ul><li>E. D. Manson-Whitton,</li><li>I. C. Stone, J. R. Jones,</li><li>P. S. Grant and</li><li>B. Cantor</li></ul> | 2517 | Isothermal grain coarsening of spray formed alloys in the semi-solid state  |
| G. Heiberg, K. Nogita,<br>A. K. Dahle and L. Arnberg  | 2537 | Columnar to equiaxed transition of eutectic in hypoeutectic aluminium-silicon alloys  |
| N. Sridhar, D. J. Srolovitz and B. N. Cox   | 2547 | Buckling and post-buckling kinetics of compressed thin films on viscous substrates  |
| P. Markondeya Raj,<br>A. Odulena<br>and W. R. Cannon  | 2559 | Anisotropic shrinkage during sintering of particle-oriented systems—numerical simulation and experimental studies                     |
| D. T. L. Alexander and<br>A. L. Greer   | 2571 | Solid-state intermetallic phase tranformations in 3XXX aluminium alloys   |
| A. C. Lund and<br>P. W. Voorhees  | 2585 | The effects of elastic stress on microstructural development: the three-dimensional microstructure of a $\gamma\text{-}\gamma'$ alloy |
| M. Kumar, A. J. Schwartz<br>and W. E. King  | 2599 | Microstructural evolution during grain boundary engineering of low to medium stacking fault energy fcc materials                      |
| H. Chai and B. R. Lawn  | 2613 | Cracking in brittle laminates from concentrated loads   |

R. F. Cook and J. Thurn 2627 Stable dielectric fracture at interconnects from electromigration stresses F. Czerwinski 2639 The oxidation behaviour of an AZ91D magnesium alloy at high temperatures G. Ghosh and G. B. Olson 2655 The isotropic shear modulus of multicomponent Fe-base solid solutions Y. L. Chiu and 2677 A TEM investigation on indentation plastic zones in A. H. W. Ngan Ni<sub>3</sub>Al(Cr,B) single crystals K. Matsuura and M. Kudoh 2693 Surface modification of titanium by a diffusional carbonitriding method T. Zakroczymski and 2701 Electrochemical investigation of hydrogen absorption in a E. Owczarek duplex stainless steel H. Y. Yasuda, D. Furuta, 2715 Fatigue mechanism in Ni<sub>3</sub>Fe single crystals with L1<sub>2</sub> A. Sasaki, A. Izaki and superlattice structure Y. Umakoshi M. S. El-Eskandarany, J. Saida 2725 Amorphization and crystallization behaviors of glassy and A. Inoue Zr<sub>70</sub>Pd<sub>30</sub> alloys prepared by different techniques H. Choi-Yim, R. D. Conner. Processing, microstructure and properties of ductile metal 2737 F. Szuecs and particulate reinforced Zr<sub>57</sub>Nb<sub>5</sub>Al<sub>10</sub>Cu<sub>15.4</sub>Ni<sub>12.6</sub> bulk metallic W. L. Johnson glass composites Y. J. Liu and I. T. H. Chang 2747 The correlation of microstructural development and thermal stability of mechanically alloyed multicomponent Fe-Co-Ni-Zr-B alloys I Keywords NUMBER 11 F. Ye and W.-Z. Zhang 2761 Coincidence structures of interfacial steps and secondary misfit dislocations in the habit plane between Widmanstätten cementite and austenite M. T. A. Saif, S. Zhang, 2779 Effect of native Al<sub>2</sub>O<sub>3</sub> on the elastic response of nanoscale Al films A. Haque and K. J. Hsia A. Wilson, G. Bozzolo, 2787 Experimental verification of the theoretical prediction of R. D. Noebe and J. M. the phase structure of a Ni-Al-Ti-Cr-Cu alloy Howe S. Gourdet and F. Montheillet 2801 Effects of dynamic grain boundary migration during the hot compression of high stacking fault energy metals

| <ul><li>M. S. Bharathi, M. Lebyodkin,</li><li>G. Ananthakrishna,</li><li>C. Fressengeas and</li><li>L. P. Kubin</li></ul> | 2813 | The hidden order behind jerky flow  |
|---|------|---|
| M. A. Muñoz-Morris,<br>C. Garcia Oca and<br>D. G. Morris  | 2825 | An analysis of strengthening mechanisms in a mechanically alloyed, oxide dispersion strengthened iron aluminide intermetallic |
| M. D. Nave, A. K. Dahle and D. H. StJohn  | 2837 | Halo formation in directional solidification  |
| H. Conrad and D. Yang   | 2851 | Effect of an electric field on the plastic deformation kinetics of electrodeposited Cu at low and intermediate temperatures   |
| TJ. Lim, B. Smith and D. L. McDowell  | 2867 | Behavior of a random hollow sphere metal foam   |
| A. Duckham, O. Engler and R. D. Knutsen   | 2881 | Moderation of the recrystallization texture by nucleation at copper-type shear bands in Al-1Mg                                |
| H. M. Jensen  | 2895 | Residual stress effects on the compressive strength of uni-<br>directional fibre composites                                   |
| E. Miura, K. Yoshimi and S. Hanada  | 2905 | Oxygen-molybdenum interaction with dislocations in Nb-<br>Mo single crystals at elevated temperatures                         |
| A. Manonukul, F. P. E. Dunne and D. Knowles   | 2917 | Physically-based model for creep in nickel-base superalloy C263 both above and below the gamma solvus                         |
| J. Liang, R. Huang, H. Yin,<br>J. C. Sturm, K. D. Hobart<br>and Z. Suo  | 2933 | Relaxation of compressed elastic islands on a viscous layer   |
| W. W. Mullins and J. Viñals   | 2945 | Linear bubble model of abnormal grain growth  |
| H. Yoshida, Y. Ikuhara and T. Sakuma  | 2955 | Grain boundary electronic structure related to the high-temperature creep resistance in polycrystalline ${\rm Al_2O_3}$       |
| Y. M. Jin and G. J. Weng  | 2967 | A direct method for the crystallography of martensitic transformation and its application to TiNi and AuCd                    |
| <ul><li>E. B. Tadmor,</li><li>U. V. Waghmare,</li><li>G. S. Smith and E. Kaxiras</li></ul>                                | 2989 | Polarization switching in PbTiO <sub>3</sub> : an ab initio finite element simulation   |
| J. Gao, T. Volkmann and<br>D. M. Herlach  | 3003 | Undercooling-dependent solidification behavior of levitated $Nd_{14}Fe_{79}B_7$ alloy droplets                                |

C. S. Pande and 3013 Modeling of grain growth in two dimensions A. K. Rajagopal S. Kustov, S. Golvandin, 3023 Influence of martensite stabilization on the low-temperature K. Sapozhnikov, E. Cesari, non-linear anelasticity in Cu-Zn-Al shape memory alloys J. Van Humbeeck and R. De Batist G. Lucadamo and 3045 Dislocation emission at junctions between  $\Sigma = 3$  grain D. L. Medlin boundaries in gold thin films I Keywords NUMBER 12 C. E. Krill III and L.-Q. Chen 3057 Computer simulation of 3-D grain growth using a phasefield model H. S. Zurob. Modeling recrystallization of microalloyed austenite: effect C. R. Hutchinson, of coupling recovery, precipitation and recrystallization Y. Brechet and G. Purdy S. Swaminathan, B. Srinivasa 3093 The production of AlN-rich matrix composites by the reactive infiltration of Al alloys in nitrogen Rao and V. Jayaram S. Chevalier and J. P. Larpin 3105 Formation of perovskite type phases during the high temperature oxidation of stainless steels coated with reactive element oxides J. Peña, F. J. Gil and 3115 Effect of microstructure on dry sliding wear behaviour in J. M. Guilemany CuZnAl shape memory alloys J. A. Wert 3125 Macroscopic crystal rotation patterns in rolled aluminium single crystals X. H. Wang and Y. C. Zhou 3141 Microstructure and properties of Ti<sub>3</sub>AlC<sub>2</sub> prepared by the solid-liquid reaction synthesis and simultaneous in-situ hot pressing process C. M. Wang and M. Mitomo 3151 Atomic structural environment of Y in the residual glass phase of silicon nitride and α-sialon J. P. Monchoux and 3159 Microstucture evolution and interfacial properties in the E. Rabkin Fe-Pb system M. Preuss, P. J. Withers, 3175 SiC single fibre full-fragmentation during straining in a Ti-E. Maire and J.-Y. Buffiere 6Al-4V matrix studied by synchrotron X-rays K. C. R. Abell and 3191 Deformation induced phase rearrangement in near eutectic Y.-L. Shen tin-lead alloy

| C. T. Liu, C. L. Fu,<br>L. M. Pike and<br>D. S. Easton                | 3203 | Magnetism-induced solid solution effects in intermetallic $Ni_{60}Al_{40}$   |
|---|------|--|
| J. Odqvist, M. Hillert and<br>J. Ågren                                | 3211 | Effect of alloying elements on the $\gamma$ to $\alpha$ transformation in steel. I   |
| E. Rabkin, V. N. Semenov and A. Winkler                               | 3227 | Percolation effects during interdiffusion in the Cu-NiAl system  |
| M. Li, K. Nagashio and<br>K. Kuribayashi                              | 3239 | Reexamination of the solidification behavior of undercooled Ni-Sn eutectic melts   |
| L. Dupuy and JJ. Blandin  | 3251 | Damage sensitivity in a commercial Al alloy processed by equal channel angular extrusion   |
| F. Czerwinski   | 3265 | On the generation of thixotropic structures during melting of Mg-9%Al-1%Zn alloy   |
| M. Hillert, M. Schwind and M. Selleby                                 | 3283 | Trapping of vacancies by rapid solidification  |
|   | I    | Keywords   |
|   |      | NUMBER 13  |
| J. M. Feppon and<br>W. B. Hutchinson                                  | 3293 | On the growth of grains  |
| A. Arya, G. K. Dey,<br>V. K. Vasudevan and<br>S. Banerjee             | 3301 | Effect of chromium addition on the ordering behaviour of Ni-Mo alloy: experimental results vs. electronic structure calculations   |
| A. M. Deus, M. A. Fortes,<br>P. J. Ferreira and<br>J. B. Vander Sande | 3317 | A general approach to grain growth driven by energy density differences  |
| E. M. Heian, A. Feng and Z. A. Munir                                  | 3331 | A kinetic model for the field-activated synthesis of MoSi <sub>2</sub> /SiC composites: simulation of SPS conditions               |
| A. Y. Badmos, H. J. Frost and<br>I. Baker                             | 3347 | Microstructural evolution during directional annealing   |
| SY. Chung, D. Y. Yoon and SJ. L. Kang                                 | 3361 | Effects of donor concentration and oxygen partial pressure on interface morphology and grain growth behavior in SrTiO <sub>3</sub> |
| M. Zinkevich and N. Mattern   | 3373 | Thermodynamic modeling of the Fe-Mo-Zr system  |
| L. Klinger  | 3385 | Surface evolution in two-component system  |

| D. Moldovan, D. Wolf,<br>S. R. Phillpot and<br>A. J. Haslam  | 3397 | Role of grain rotation during grain growth in a columnar microstructure by mesoscale simulation                          |
|--|------|--|
| E. M. Schulson   | 3415 | Compressive shear faults in ice: plastic vs. Coulombic faults  |
| L. H. Qian, S. C. Wang,<br>Y. H. Zhao and K. Lu  | 3425 | Microstrain effect on thermal properties of nanocrystalline Cu   |
| M. Legros, K. J. Hemker,<br>A. Gouldstone, S. Suresh,<br>RM. Keller-Flaig and<br>E. Arzt                     | 3435 | Microstructural evolution in passivated Al films on Si substrates during thermal cycling                                 |
| <ul><li>R. Voytovych, I. MacLaren,</li><li>M. A. Gülgün,</li><li>R. M. Cannon and</li><li>M. Rühle</li></ul> | 3453 | The effect of yttrium on densification and grain growth in $\alpha\text{-alumina}$                                       |
| K. Kawabata, E. Sato<br>and K. Kuribayashi   | 3465 | Creep deformation behavior of spherical $Al_2O_3$ particle-reinforced $Al$ - $Mg$ matrix composites at high temperatures |
| F. Gutierrez-Mora, K. C. Goretta, S. Majumdar, J. L. Routbort, M. Grimdisch and A. Dominguez-Rodriguez       | 3475 | Influence of internal stresses in superplastic joining of zirconia toughened alumina                                     |
| T. F. Guo and L. Cheng   | 3487 | Modeling vapor pressure effects on void rupture and crack growth resistance  |
| Z. P. Lu and C. T. Liu   | 3501 | A new glass-forming ability criterion for bulk metallic glasses  |
| C. Domain, R. Besson and A. Legris   | 3513 | Atomic-scale Ab-initio study of the Zr-H system: I. Bulk properties  |
| X. Zhang, H. Wang,<br>R. O. Scattergood,<br>J. Narayan and<br>C. C. Koch                                     | 3527 | Mechanical properties of cyromilled nanocrystalline Zn studied by the miniaturized disk bend test                        |
|  | I    | Keywords   |
|  |      | NUMBER 14  |
| K. A. Tsoi, R. Stalmans and<br>J. Schrooten  | 3535 | Transformational behaviour of constrained shape memory alloys  |

| A. T. W. Kempen,<br>F. Sommer and<br>E. J. Mittemeijer            | 3545 | The kinetics of the austenite-ferrite phase transformation of Fe-Mn: differential thermal analysis during cooling   |
|---|------|---|
| F. Dalle, E. Perrin,<br>P. Vermaut, M. Masse and<br>R. Portier    | 3557 | Interface mobility in $Ni_{49.8}Ti_{42.2}Hf_8$ shape memory alloy   |
| K. Q. Qiu, H. F. Zhang,<br>A. M. Wang, B. Z. Ding<br>and Z. Q. Hu | 3567 | Glass-forming ability and thermal stability of $Nd_{70-x}Fe_{20}Al_{10}Y_x$ alloys  |
| C. L. Muhlstein, E. A. Stach and R. O. Ritchie                    | 3579 | A reaction-layer mechanism for the delayed failure of<br>micron-scale polycrystalline silicon structural films<br>subjected to high-cycle fatigue loading |
| R. N. Lumley, A. J. Morton and I. J. Polmear                      | 3597 | Enhanced creep performance in an Al-Cu-Mg-Ag alloy through underageing  |
| Y. Mishin, P. Sofronis and<br>J. L. Bassani                       | 3609 | Thermodynamic and kinetic aspects of interfacial decohesion   |
| L. Pang, S. M. Han and<br>K. S. Kumar                             | 3623 | Tensile response of an Fe-40Al-0.7C-0.5B alloy  |
| A. A. Elmustafa and D. S. Stone                                   | 3641 | Indentation size effect in polycrystalline F.C.C. metals  |
| A. Maximenko, G. Roebben and O. Van Der Biest                     | 3651 | Modeling of non-linear phenomena during deformation of interparticle necks by diffusion-controlled creep  |
| M. W. Nordbakke, N. Ryum and O. Hunderi                           | 3661 | Invariant distributions and stationary correlation functions of simulated grain growth processes  |
| H. Xiao, I. M. Robertson and H. K. Birnbaum                       | 3671 | Deuterium driven phase transitions in the $Ti_3Al$ intermetallic  |
| Y. Li and J. E. Morral  | 3683 | A local equilibrium model for internal oxidation  |
| U. Fröbel and F. Appel  | 3693 | Strain ageing in $\gamma(\mathrm{TiAI})\text{-based}$ titanium aluminides due to antisite atoms   |
| K. Sun  | 3709 | Ga-rich precipitates in Fe ion implanted GaAs   |
| T. Kuwabara, A. Van Bael and E. Iizuka                            | 3717 | Measurement and analysis of yield locus and work hardening characteristics of steel sheets with different r-values  |
| T. Nakano, M. Azuma and Y. Umakoshi                               | 3731 | Tensile deformation and fracture behaviour in $NbSi_2$ and $MoSi_2$ single crystals   |

- D. J. Walker and R. F. Cochrane
- K. Dragnevski, A. M. Mullis, 3743 Mechanical deformation of dendrites by fluid flow during the solidification of undercooled melts

### I Keywords

#### NUMBER 15

W. J. Tseng and C. H. Wu 3757 Aggregation, rheology and electrophoretic packing structure of aqueous A1<sub>2</sub>O<sub>3</sub> nanoparticle suspensions J. Man, K. Obrtlík, Atomic force microscopy of surface relief in individual 3767 C. Blochwitz and J. Polák grains of fatigued 316L austenitic stainless steel C.-Y. Hung, G. Spanos, 3781 Three-dimensional observations of proeutectoid cementite R. O. Rosenberg and precipitates at short isothermal transformation times M. V. Kral Q. Liu, X. Huang, 3789 Microstructure and strength of commercial purity D. J. Lloyd and N. Hansen aluminium (AA 1200) cold-rolled to large strains W. Zhang, J. R. Smith and 3803 The connection between ab initio calculations and interface A. G. Evans adhesion measurements on metal/oxide systems: Ni/Al<sub>2</sub>O<sub>3</sub> and Cu/Al<sub>2</sub>O<sub>3</sub> P.-R. Cha, S. G. Kim, 3817 A phase field model for the solute drag on moving grain D.-H. Yeon and J.-K. Yoon boundaries W. Kan and H. Wong 3831 Self-similar growth of multiple compound layers in binary diffusion couples with application to the "multi-foil" method E. Abe, Y. Kawamura, 3845 Long-period ordered structure in a high-strength K. Hayashi and A. Inoue nanocrystalline Mg-1 at% Zn-2 at% Y alloy studied by atomic-resolution Z-contrast STEM L. M. Pike, I. M. Anderson, 3859 Site occupancies, point defect concentrations, and solid C. T. Liu and Y. A. Chang solution hardening in B2 (Ni,Fe)Al D. Korn, G. Elssner 3881 Fracture properties of interfacially doped Nb-Al<sub>2</sub>O<sub>3</sub> R. M. Cannon and bicrystals: I, fracture characteristics M. Rühle, R. M. Cannon, D. Korn, 3903 Fracture properties of interfacially doped Nb-Al<sub>2</sub>O<sub>3</sub> G. Elssner and M. Rühle bicrystals: II, relation of interfacial bonding, chemistry and local plasticity A. Hasnaoui, 3927 On non-equilibrium grain boundaries and their effect on H. Van Swygenhoven and thermal and mechanical behaviour: a molecular dynamics P. M. Derlet computer simulation

J. M. Ford, J. Wheeler and 3941 Computer simulation of grain-boundary diffusion creep A. B. Movchan F. Dalla Torre. 3957 Nanocrystalline electrodeposited Ni: microstructure and H. Van Swygenhoven and tensile properties M. Victoria 3971 Erratum I Keywords NUMBER 16 J. M. Calderón-Moreno, 3973 Superplastic behavior of zirconia-reinforced alumina M. Schehl and M. Popa nanocomposites from powder alcoxide mixtures J. Y. Song and Jin Yu 3985 Analysis of the T-peel strength in a Cu/Cr/Polyimide system X. Zhang, H. Wang, 3995 Modulated oscillatory hardening and dynamic R. O. Scattergood, recrystallization in cryomilled nanocrystalline Zn J. Narayan and C. C. Koch J.-C. Lee, H.-K. Seok and 4005 Microstructural evolutions of the Al strip prepared by cold J.-Y. Suh rolling and continuous equal channel angular pressing 4021 Precipitation strengthening at ambient and elevated E. A. Marquis, D. N. Seidman and temperatures of heat-treatable Al(Sc) alloys D. C. Dunand C. A. Cooper, R. Elliott and 4037 Investigation of elastic property relationships for flake and R. J. Young spheroidal cast irons using Raman spectroscopy D. G. Morris and 4047 Microstructure of severely deformed Al-3Mg and its M. A. Muñoz-Morris evolution during annealing 4061 Coarsening of ordered intermetallic precipitates with V. Vaithyanathan and L. Q. Chen coherency stress N. H. Pryds, J. H. Hattel, 4075 An integrated numerical model of the spray forming T. B. Pedersen and process J. Thorborg S. R. Shah and R. Raj 4093 Mechanical properties of a fully dense polymer derived ceramic made by a novel pressure casting process T. Ichitsubo, M. Tane, H. Ogi, 4105 Anisotropic elastic constants of lotus-type porous copper: M. Hirao, T. Ikeda and H. measurements and micromechanics modeling

Nakajima

H. Nitta, T. Yamamoto, 4117 Diffusion of molybdenum in α-iron R. Kanno, K. Takasawa, T. Iida, Y. Yamazaki, S. Ogu and Y. Iijima R. Yu, Q. Zhan, L. L. He, 4127 Si-induced twinning of TiC and formation of Ti<sub>3</sub>SiC<sub>2</sub> Y. C. Zhou and H. O. Ye platelets R. Huang, J. H. Prévost and 4137 Loss of constraint on fracture in thin film structures due to Z. Suo T. Ganne, J. Crépin, S. Serror 4149 Cracking behaviour of PVD tungsten coatings deposited on steel substrates and A. Zaoui 4165 Strengthening mechanisms of an Al-Mg-Sc-Zr alloy K. L. Kendig and D. B. Miracle R. Ueji, N. Tsuji, 4177 Ultragrain refinement of plain low carbon steel by cold-Y. Minamino and rolling and annealing of martensite Y. Kcizumi M. Backhaus-Ricoult. 4191 Changes in Cu-silica interfacial chemistry with oxygen L. Samet, M. Thomas, chemical potential M.-F. Trichet and D. Imhoff Keywords NUMBER 17 J. Liu and P. Bowen 4205 Fatigue crack growth in a TiB21s/SCS-6 composite K. T. Voisey, T. Klocker and 4219 Measurement of melt ejection velocities during laser T. W. Clyne drilling of steel, using a novel droplet stream interception technique P. Li and J. M. Howe 4231 Dislocation reactions in ZrN M.-H. Zhao, R. Fu, D. Lu and 4241 Critical thickness for cracking of Pb(Zr<sub>0.53</sub>Ti<sub>0.47</sub>)O<sub>3</sub> thin T.-Y. Zhang films deposited on Pt/Ti/Si(100) substrates J. Khalil-Allafi, A. Dlouhy and 4255 Ni<sub>4</sub>Ti<sub>3</sub>-precipitation during aging of NiTi shape memory G. Eggeler alloys and its influence on martensitic phase transformations S. Lathabai and P. G. Lloyd 4275 The effect of scandium on the microstructure, mechanical properties and weldability of a cast Al-Mg alloy

4293 High-temperature creep behavior of TiC particulate

reinforced Ti-6Al-4V alloy composite

Z. Y. Ma. R. S. Mishra and

S. C. Tjong

X. Xie and Y. Mishin 4303 Monte Carlo simulation of grain boundary segregation and decohesion in NiAl J. Yu. D. K. Joo and 4315 Rupture time analyses of the Sn-3.5Ag solder alloys S. W. Shin containing Cu or Bi A. R. de Arellano-López, 4325 Compressive creep of mullite containing Y<sub>2</sub>O<sub>3</sub> J. J. Meléndez-Martínez, T. A. Cruse, R. E. Koritala, J. L. Routbort and K. C. Goretta H. Paul, J. H. Driver, 4339 Crystallographic aspects of the early stages of C. Maurice and recrystallisation in brass-type shear bands Z. Jasieński B. C. Wei, W. Löser, L. Xia. 4357 Anomalous thermal stability of Nd-Fe-Co-Al bulk S. Roth, M. X. Pan, metallic glass W. H. Wang and J. Eckert H. Wang, Y. Bai, S. Liu, 4369 Combined effects of silica filler and its interface in epoxy J. Wu and C. P. Wong resin D. Raabe, Z. Zhao and 4379 On the dependence of in-grain subdivision and deformation W. Mao texture of aluminum on grain interaction R. B. Jones, C. M. Younes, 4395 The effect of the microscale distribution of boron on the P. J. Heard, R. K. Wild and yield strength of C-Mn steels subjected to neutron P. E. J. Flewitt irradiation Z. Y. Ma, R. S. Mishra and 4419 Superplastic deformation behaviour of friction stir M. W. Mahoney processed 7075Al alloy M. Zelin 4431 Microstructure evolution in pearlitic steels during wire drawing I Keywords NUMBER 18 L. Tan and W. C. Crone 4449 Surface characterization of NiTi modified by plasma source ion implantation 4461 Production of ultra-fine grain microstructures in Al-Mg A. Gholinia, F. J. Humphreys and P. B. Prangnell alloys by coventional rolling M. Seshadri, S. J. Bennison, 4477 Mechanical response of cracked laminated plates A. Jagota and S. Saigal

| J. Li, S. L. Johns,<br>B. M. Iliescu, H. J. Frost<br>and I. Baker                 | 4491 | The effect of hot zone velocity and temperature gradient on the directional recrystallization of polycrystalline nickel  |
|---|------|--|
| D. Caillard, C. Roucau,<br>L. Bresson and D. Gratias                              | 4499 | Dislocation motions in 5-fold planes of icosahedral Al-Pd-Mn   |
| P. A. Carvalho, P. M. Bronsveld, B. J. Kooi and J. Th. M. De Hosson               | 4511 | On the fcc $\rightarrow$ D0 <sub>19</sub> transformation in Co–W alloys  |
| Y. Hayakawa and<br>M. Kurosawa  | 4527 | Orientation relationship between primary and secondary recrystallized texture in electrical steel  |
| R. A. Masumura, B. B. Rath and C. S. Pande  | 4535 | Analysis of Cu-Ni diffusion in a spherical geometry for excess vacancy production  |
| O. N. Mryasov,<br>Yu. N. Gornostyrev,<br>M. van Schilfgaarde and<br>A. J. Freeman | 4545 | Superdislocation core structure in L1 <sub>2</sub> Ni <sub>3</sub> Al, Ni <sub>3</sub> Ge and Fe <sub>3</sub> Ge: Peierls–Nabarro analysis starting from ab-initio GSF energetics calculations |
| A. Bravo-Leon, Y. Morikawa,<br>M. Kawahara and<br>M. J. Mayo                      | 4555 | Fracture toughness of nanocrystalline tetragonal zirconia with low yttria content  |
| Q. Meng, N. Zhou, Y. Rong, S. Chen, and T. Y. Hsu                                 | 4563 | Size effect on the Fe nanocrystalline phase transformation   |
| A. Das, S. Ji and Z. Fan  | 4571 | Morphological development of solidification structures under forced fluid flow: a Monte-Carlo simulation   |
| D. N. Wasnik, V. Kain,<br>I. Samajdar, B. Verlinden<br>and P.K. De                | 4587 | Resistance to sensitization and intergranular corrosion through extreme randomization of grain boundaries  |
| N. R. Tao, Z. B. Wang,<br>W. P. Tong, M. L. Sui,<br>J. Lu and K. Lu               | 4603 | An investigation of surface nanocrystallization mechanism in Fe induced by surface mechanical attrition treatment  |
| I. V. Belova and G. E. Murch  | 4617 | A new analysis of diffusion in ternary alloys: application to f.c.c. Fe-Ni-Cr alloys   |
| C. Capdevila, F. G. Caballero and C. García de Andrés                             | 4629 | Kinetics model of isothermal pearlite formation in a 0.4C-1.6Mn steel  |
| K. Gall and H. J. Maier   | 4643 | Cyclic deformation mechanisms in precipitated NiTi shape memory alloys   |

Y. W. Bao, S. B. Su, 4659 Nondestructively determining local strength and residual J. J. Yang, L. Sun and stress of glass by Hertzian indentation J. H. Gong B. Kobe and N. S. McIntyre 4667 Investigation of reactions between lead/tin solder and palladium surface finishes V. M. Orera, R. Cemborain, Piezo-spectroscopy at low temperatures: residual stresses in R. I. Merino, J. I. Peña and Al<sub>2</sub>O<sub>3</sub>\_ZrO<sub>2</sub>(Y<sub>2</sub>O<sub>3</sub>) eutectics measured from 77 to A. Larrea 350 K 4687 Photoluminescence of CdSe and CdS nanosolids C. Q. Sun, S. Li, B. K. Tay and T. P. Chen Keywords NUMBER 19 S. Zghal, M. J. Hÿtch, Electron microscopy nanoscale characterization of ball-4695 J.-P. Chevalier, R. Twesten. milled Cu-Ag powders. Part I: Solid solution synthesized F. Wu and P. Bellon by cryo-milling S. Zghal, R. Twesten, F. Wu 4711 Electron microscopy nanoscale characterization of ball and P. Bellon milled Cu-Ag powders. Part II: Nanocomposites synthesized by elevated temperature milling or annealing O. Dezellus, F. Hodaj, 4727 Influence of evaporation-condensation in reactive spreading S. Janaqi and N. Eustathopoulos O. Dezellus, F. Hodaj and 4741 Chemical reaction-limited spreading: the triple line velocity N. Eustathopoulos versus contact angle relation S. Lee, S. Kim, B. Hwang, 4755 Effect of carbide distribution on the fracture toughness in B. S. Lee and C. G. Lee the transition temperature region of an SA 508 steel S. S. Babu, J. W. Elmer, 4763 Time-resolved X-ray diffraction investigation of primary weld solidification in Fe-C-Al-Mn steel welds J. M. Vitek and S. A. David 4783 Modeling crystallization processes: transformation diagrams J. J. Suñol, R. Berlanga, M. T. Clavaguera-Mora and N. Clavaguera A. F. Jankowski, M. A. Wall, 4791 From nanocrystalline to amorphous structure in beryllium-A. W. Van Buuren, based coatings T. G. Nieh and J. Wadsworth J. C. F. Millett, N. K. Bourne, 4801 The response of TiAl based alloys to one-dimensional G. T. Gray III and shock loading I. P. Jones

D. N. Kedlaya and Failure prediction of graphite/epoxy laminates with induced intermittent load surge during fatigue A. A. Pelegri X. Zhang, H. Wang, 4823 Studies of deformation mechanisms in ultra-fine-grained R. O. Scattergood. and nanostructured Zn J. Narayan, C. C. Koch, A. V. Sergueeva and A. K. Mukherjee J.-F. Yang, G.-J. Zhang, 4831 Synthesis and properties of porous Si<sub>3</sub>N<sub>4</sub>/SiC N. Kondo and T. Ohji nanocomposites by carbothermal reaction between Si<sub>3</sub>N<sub>4</sub> and carbon J. A. Sekhar 4841 The location of the first side branch instabilty during directional solidification J. R. Cho, D. Dye, 4847 Intergranular strain accumulation in a near-alpha titanium K. T. Conlon, alloy during plastic deformation M. R. Daymond and R. C. Reed O.-S. Kwon, S.-H. Hong, 4865 Microstructural evolution during sintering of TiO<sub>2</sub>/SiO<sub>2</sub>-J.-H. Lee, U.-J. Chung, doped alumina: mechanism of anisotropic abnormal grain D.-Y. Kim and growth N. M. Hwang L. Dupuy and M. C. Fivel A study of dislocation junctions in FCC metals by an orientation dependent line tension model R. Bouchet and R. Mevrel 4887 A numerical inverse method for calculating the interdiffusion coefficients along a diffusion path in ternary systems K. Ito, Y. Okabe, 4901 Reversible hydrogen absorption/desorption and related L. T. Zhang and phase transformations in a Ti<sub>3</sub>Al alloy with the M. Yamaguchi stoichiometry composition J. A. Vreeling, V. Ocelík and 4913 Ti-6Al-4V strengthened by laser melt injection of WC<sub>n</sub> J. T. M. De Hosson particles R. Adelung, W. Hartung and 4925 Fabrication of Cu-induced networks of linear F. Ernst nanostructures on different length scales I Keywords NUMBER 20 4935 Announcement 4937 Announcement V. Stoilov and 4939 A theoretical framework of one-dimensional sharp phase A. Bhattacharyya fronts in shape memory alloys R. W. Hayes, 4953 Creep behavior of Ti-6Al-2Sn-4Zr-2Mo: I. The effect of G. B. Viswanathan and nickel on creep deformation and microstructure M. J. Mills

G. B. Viswanathan. 4965 Creep behaviour of Ti-6Al-2Sn-4Zr-2Mo: II. Mechanisms S. Karthikeyan, of deformation R. W. Hayes and M. J. Mills J. Carmai, K. H. Baik, 4981 Interface effects during consolidation in titanium alloy F. P. E. Dunne, P. S. Grant components locally reinforced with matrix-coated fibre and B. Cantor composite 4995 Modeling of graphitization kinetics during peritectic M. D. Demetriou, N. M. Ghoniem and melting of tungsten carbide A. S. Lavine V. Yamakov, D. Wolf, 5005 Deformation twinning in nanocrystalline Al by molecular-S. R. Phillpot and H. Gleiter dynamics simulation G. Dehm, B. J. Inkson and 5021 Growth and microstructural stability of epitaxial Al films T. Wagner on (0001) α-Al<sub>2</sub>O<sub>3</sub> substrates B. J. Inkson, G. Dehm and 5033 In situ TEM observation of dislocation motion in thermally strained Al nanowires T. Wagner L. Thilly, F. Lecouturier and 5049 Size-induced enhanced mechanical properties of J. von Stebut nanocomposite copper/niobium wires: nanoindentation H. Conrad and J. Narayan 5067 Mechanisms for grain size hardening and softening in Zn 5079 Utilizing the SIMS technique in the study of grain S. M. Schwarz, B. W. Kempshall, boundary diffusion along twist grain boundaries in the L. A. Giannuzzi and Cu(Ni) system F. A. Stevie Y. Yang, Y. Mei, H. Chen, 5085 CdS nanocrystallites prepared by chemical and physical J. Chen, X. Wu and X. Bao templates T. Kruml, E. Conforto, 5091 From dislocation cores to strength and work-hardening: a B. Lo Piccolo, D. Caillard study of binary Ni<sub>3</sub>Al and J. L. Martin L. Karlsson, A. Hörling, 5103 The influence of thermal annealing on residual stresses and M. P. Johansson, mechanical properties of arc-evaporated  $TiC_xN_{1-x}$  (x=0, L. Hultman and 0.15 and 0.45) thin films G. Ramanath

| K. Gall, M. L. Dunn, Y. Liu,<br>D. Finch, M. Lake and<br>N. A. Munshi           | 5115 | Shape memory polymer nanocomposites   |
|---|------|---|
| L. Delannay, R. E. Logé,<br>Y. Chastel and<br>P. Van Houtte                     | 5127 | Prediction of intergranular strains in cubic metals using a multisite elastic-plastic model       |
| A. Kusoffsky  | 5139 | Thermodynamic evaluation of the ternary Ag-Au-Cu system-including a short range order description |
| N. Yu. Taranets,<br>V. I. Nizhenko,<br>V. V. Poluyanskaya and<br>Yu. V. Naidich | 5147 | Ge-Al and Sn-Al alloys capillary properties in contact with aluminum nitride                      |
| D. Min and H. Wong  | 5155 | A model of migrating grain-boundary grooves with application to two mobility-measurement methods  |
| S. Fabris, A. T. Paxton and<br>M. W. Finnis                                     | 5171 | A stabilization mechanism of zirconia based on oxygen vacancies only                              |
|   | I    | List of Contents, Author Index and Keyword Index, Volume 50                                       |
|   | XLV  | Keywords  |

